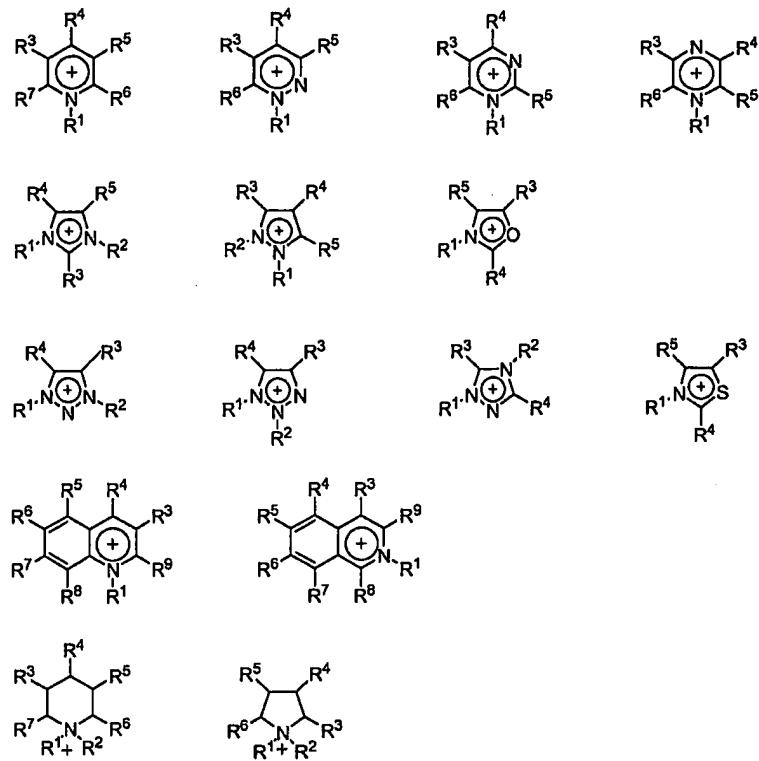


Claims

1. A method for depolymerizing starch comprising mixing a starch material with an ionic liquid solvent to dissolve the starch, and then treating the dissolved starch by agitating at a temperature and for a period of time to effect depolymerization of the starch into desired depolymerization products.
2. The method according to claim 1 wherein microwave irradiation is applied to assist in dissolution and depolymerization.
3. The method according to claim 1 or 2 wherein pressure is applied to assist in dissolution and depolymerization.
- 10 4. The method according to any of claims 1 to 3 wherein the depolymerization temperature is at least 70°C, preferably at least 80°C.
5. The method according to any of claims 1 to 4 wherein the depolymerization period is at least 5 minutes.
- 15 6. The method according to any of claims 1 to 5 wherein the starch is depolymerized selectively such that the amylose of the starch is depolymerized into sugars and the amylopectin of the starch is retained essentially unchanged.
7. The method according to any of claims 1 to 5 wherein the starch is depolymerized quantitatively such that both the amylose and the amylopectin of the starch are depolymerized into sugars.
- 20 8. The method according to claim 1 wherein the ionic liquid solvent is molten at a temperature of below 200°C.
9. The method according to claim 1 wherein the cation of the ionic liquid solvent is selected from the group consisting of

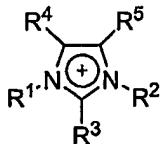
15



wherein R^1 and R^2 are independently a C_1 - C_6 alkyl or C_2 - C_6 alkoxyalkyl group, and R^3 , R^4 , R^5 , R^6 , R^7 , R^8 and R^9 are independently hydrogen, a C_1 - C_6 alkyl, C_2 - C_6 alkoxyalkyl or C_1 - C_6 alkoxy group or halogen, and

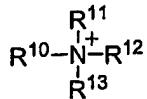
- 5 wherein the anion of the ionic liquid solvent is halogen, pseudohalogen, perchlorate or C_1 - C_6 carboxylate.

10. The method according to claim 9 wherein said cation comprises



- wherein R^3 - R^5 are each hydrogen and R^1 and R^2 are the same or different and represent C_1 - C_6 alkyl, and said anion is halogen, preferably chloride.

11. The method according to claim 1 wherein the cation of the ionic liquid solvent is



wherein R¹⁰, R¹¹, R¹² and R¹³ are independently a C₁-C₃₀ alkyl, C₃-C₈ carbocyclic or C₃-C₈ heterocyclic group and the anion of the ionic liquid solvent is halogen, pseudohalogen, perchlorate, C₁-C₆ carboxylate or hydroxide.

12. The method according to claim 1 wherein the depolymerization products are
5 separated from the solution by adding a non-solvent for the depolymerization products to precipitate the depolymerization products.

13. The method according to claim 12 wherein said non-solvent is an alcohol, a ketone, acetonitrile, dichloromethane, a polyglycol, an ether or water.

14. The method according to claim 1 wherein the depolymerization products are
10 separated by extraction with a non-solvent for the ionic liquid solvent.